The Knowledge Bank at The Ohio State University

Ohio State Engineer

Title:	Methuselah Goes Modern
Creators:	Lynch, Roland H.
Issue Date:	Dec-1939
Publisher:	Ohio State University, College of Engineering
Citation:	Ohio State Engineer, vol. 23, no. 2 (December, 1939), 8-9.
URI:	http://hdl.handle.net/1811/35659
Appears in Collections:	Ohio State Engineer: Volume 23, no. 2 (December, 1939)

METHUSELAH GOES MODERN

. . . *Glass in a New Form*

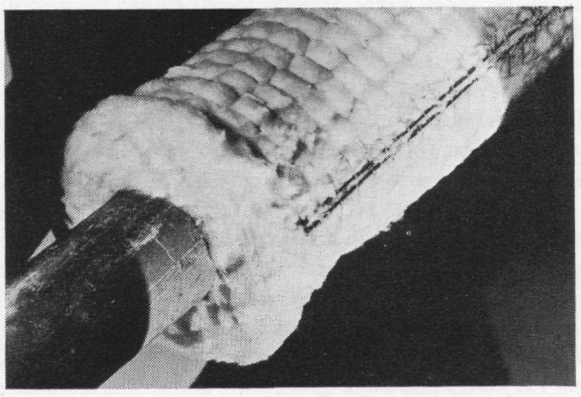
By Roland H. Lynch

A WHISTLE! Is the game over? or has it just begun? Has man won again in his ceaseless struggle with nature — or just scored? Only time can tell.

To begin with, man has known of a certain material for some 40 centuries. This material, a veritable "Methuselah", is relatively inexpensive and almost everlasting; it remains in good condition long after the finest steels have rusted away, it does not burn and water has practically no effect upon it.

The material — glass — glass that plays such an important role in modern existence. Imagine a world without windows, without electric lights; impossible of course without glass. The wonderful material brings sight, through spectacles, to many who are nearly blind, enables scientists to study germs, thus saving countless lives, brings distant stars and planets close enough for observation. It would fill volumes to tell of the accomplishments glass has made possible, yet all that have come to pass were but the wildest imaginings of man when this "Methuselah" was young.

For hundreds of years men have attempted to transform this resourceful material into some flexible form in order to further its numerous uses. It seems a Roman, at one time or another, discovered a malleable glass only to awaken headless in order that his discovery should not lessen the value of gold and silver. The Venetians found a way of drawing glass into fine strands, which they used in decorating their glassware. Along in the 1880's a man named Hammesfahr had an idea that glass could be combined with silk to form a fabric and by 1893 Edward D. Libbey had managed to accomplish Hammesfahr's idea—he drew out a small quantity of glass into coarse strands and wove them together with threads of silk. This fabric was exhibited at the Columbian Exposition, 1893, and did not attract much attention—not much, but just enough. A celebrated actress noticed the exhibit and decided she should have a dress of this material so she promptly saw Mr. Libbey and purchased twelve yards of the fabric. Confidentially, it was not a dress to write home about, but it was a start.



Glass Pipe Insulation

Late in 1931, as a result of the untiring efforts of a certain group of men, a fibrous glass infinitely superior to the flexible glass of yore was developed. Development of this fibrous glass did not stop here, however, and as time passed finer and more flexible fibers were produced. By 1935, these glass fibers were fine enough to be woven into cloth that could be bent and folded without cracking and breaking.

And still improvement continued. New machines were invented, new formulas developed until today, we have a "Modern Methuselah", a truly flexible glass, a glass that can be bent like rubber, tied like string and woven into cloth.

This fibrous glass—now known as Fiberglas—begins life much the same as any other glass, the principal ingredients being sand, limestone and soda ash. Several other materials are added according to the formula and the mixture enters a furnace as any other glass.

In making Fiberglas wool the molten glass flows from narrow openings where it is met with blasts of high-pressure steam. The steam forces the glass into thread-like fibers considerably finer than a human hair and varying in length from an inch to as much as a foot. These fibers fall on a moving belt where they form a soft, snow white blanket.

This woolly variety of Fiberglas makes a superior insulation against heat or cold or sound. It is used in many ways as an insulator—in stoves, refrigerators, batteries, electrical equipment, in delivery trucks, trains, steam turbines and electrical insulation, not to mention many others. A material that has the remarkable advantages of being light, fire-proof and effective as an insulator will certainly solve many problems along this line. In this same woolly form Fiberglas forms an ideal filtering medium for both air and chemicals as only one acid, hydrofluoric, will attack it.

Fiberglas textile fiber is, at the present time, less important commercially than the woolly variety although its process of manufacture is even more intricate than that of the Fiberglas wool. Here the melted glass is molded into tiny marbles—not blown into threads as the other variety. These marbles are closely inspected and if imperfect are thrown out.

The marbles are reheated in an electric furnace until they become a white-hot liquid. This liquid flows through tiny, tiny holes in the base of the furnace, forming wisp-like strands—a manmade spider web with the tensile strength of steel. These strands can be twisted and wound on spools at a rate of more than a mile a minute, and single strands have been drawn out over 5000 miles in length.

A strand of Fiberglas contains 102 fine fibers and at least two strands are combined in making the finest Fiberglas thread. This thread can then be transformed, on standard textile machinery, into tape, braid, cord or cloth.

In another variety of Fiberglas textile these same marbles are heated but the glass is drawn into lengths ranging from 8 to 14 inches by means of a steam blast. This variety can be woven into a hard-finished, bulky cloth much coarser than that of the web-like variety.

Among the Fiberglas products now in development are gleaming fire-proof curtains, upholstery that is durable, beautiful and yet fire-proof, and tablecloths along with a myriad of others.

Fiberglas in all of its forms is being used extensively in our modern planes, trains and ships—for insulation against heat, cold and noise, for air-filters and for upholstery fabrics. Other industries are finding Fiberglas the solution to many of their problems—particularly in those cases where an ideal insulator is needed.

This "Modern Methuselah" has found countless uses in its few years of existence and has established itself in a great new industry—an industry that will doubtlessly grow larger day by day as this material with so many properties of great importance to the improvement and advancement of our innumerable necessities is certain to be used more and more in this modern world of changes.

Glass—Filters for Your Furnace